

# NASA TECH BRIEF

## *Marshall Space Flight Center*



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

### Generalized Safety Equation: A Concept

A proposed concept, based on a simple and straightforward mathematical probability model, attempts to provide a means of defining the relationship between safety and reliability, as well as measuring personnel safety and evaluating equipment safety.

The probability function  $P(x)$  is defined as the total probability that a specific safety category,  $x$ , will not sustain injury or damage in excess of a defined degree. The confidence placed in  $P(x)$  is directly related to the thoroughness with which the hazards are identified and the effects on the safety category are analyzed. When the desired numerical value of  $P(x)$  cannot be achieved solely through reliability, a safety system must be incorporated. However, the safety system need not prevent injury or damage from all known hazards. It is sufficient that injury or damage be prevented only for enough hazards to achieve the desired  $P(x)$  value.

Using this technique, safety systems can be hypothesized to cope with any single risk or combination of risks. The cost and effectiveness of alternate hypothetical safety systems can be estimated and used as a basis for the final system

design. However, effectiveness equations should include all categories of interest. For example, if a product's safety system is effective for the public, it will invariably be beneficial to the safety of public property; conversely, a system which prevents equipment damage generally contributes to the safety of operating personnel.

#### Note:

Requests for further information may be directed to:

Technology Utilization Officer  
Code A&TS-TU  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B71-10183

#### Patent status:

No patent action is contemplated by NASA.

Source: George Hano of  
IBM Corp.  
under contract to  
Marshall Space Flight Center  
(MFS-20522)

Category 06



# NASA TECH BRIEF

## Maneuvering Space Flight Control

This is a brief report on the progress of the research in the field of maneuvering space flight control. The report is intended for the public and is not a technical document. It is a summary of the work done in the field of maneuvering space flight control. The report is intended for the public and is not a technical document. It is a summary of the work done in the field of maneuvering space flight control.

### Maneuvering Space Flight Control

The purpose of this report is to provide a summary of the work done in the field of maneuvering space flight control. The report is intended for the public and is not a technical document. It is a summary of the work done in the field of maneuvering space flight control.

Report of the work done in the field of maneuvering space flight control.

Maneuvering Space Flight Control  
NASA  
Washington, D.C. 20546

Source: George H. H. H.  
IBM Corp.  
under contract to  
Maneuvering Space Flight Control  
(MPS-3023)

The purpose of this report is to provide a summary of the work done in the field of maneuvering space flight control. The report is intended for the public and is not a technical document. It is a summary of the work done in the field of maneuvering space flight control.

Report of the work done in the field of maneuvering space flight control.

Maneuvering Space Flight Control  
NASA  
Washington, D.C. 20546

Source: George H. H. H.  
IBM Corp.  
under contract to  
Maneuvering Space Flight Control  
(MPS-3023)